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REMARKS

Applicants respectfully request reconsideration in view of the above amendments and the following remarks. Applicants amend claims 1, 10, 16 and 25. Applicants do not add any claims or cancel any claims. Accordingly, claims 1-30 remain pending in the application.

I. Objection to Drawings

The drawings stand objected to under 37 CFR 1.83(a). Since claims 1 and 10 have been amended to cancel the feature of transforming "a set of mispredicted instructions into move instructions," the drawings show every feature of the invention specified in the claims. Accordingly, reconsideration and withdrawal of the objection to the drawings are requested.

II. Claims Rejected Under 35 U.S.C. § 103

Claims 1-5, 8-14, 16-20 and 23-29 stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over "Reducing Branch Misprediction Penalties Via Dynamic Control Independence Detection" by Chou et al. (hereinafter "Chou"), in view of U.S. Patent No. 6,542,984 issued to Keller, et al (hereinafter "Keller"), and further in view of U.S. Patent No. 6,192,465 (hereinafter "Roberts").

To establish a *prima facie* case of obviousness Examiner must show that the cited references teach or suggest each of the elements of a claim. In regard to claims 1 and 16, as amended, these claims include "a first circuit to detect an exact convergence point." Applicants believe that Chou in view of Keller and further in view of Roberts does not teach or suggest these elements of claims 1 and 16. Although, as Examiner states, Chou teaches a DCI buffer used to detect the first control independent instruction subsequent to a branch (pg. 111, col. 1, lines 6-9),

Examiner is incorrect in equating such a “first control independent instruction” with an “exact convergence point” as recited in Applicants’ claim 1. Chou defines an instruction as “control independent of a branch if it is executed regardless of the outcome of that branch” (section 1.1, ¶ 2, lines 1-2). Such a control independent instruction is analogous to block 104 and subsequent blocks as taught in Applicants’ specification (¶ 0013 and Fig. 1). Hence, a “first control independent instruction” as disclosed by Chou is analogous to block 104, equivalent to a “convergence point” as described in Applicants’ specification (¶ 0013).

An exact convergence point, on the other hand, is disclosed in the specification as a convergence point during a case of exact convergence, “where the mispredicted path converges exactly at the beginning of the correct path. This means that there are no instructions along the correct path between the mispredicted branch point and the convergence point” (¶ 0015). Block 203 in Fig. 2A is an example of an exact convergence point (¶ 0016). Thus, as can be clearly seen in Figs. 1 and 2A of Application, a convergence point (block 104) or first control independent instruction is not equivalent to an exact convergence point (block 203). In Fig. 1, there *are* instructions (block 103) along the correct path between the mispredicted branch point (block 101) and the convergence point (block 104). This is unlike the case of exact convergence in Fig. 2, where there are *no* instructions along the correct path between the mispredicted branch point (block 201) and the exact convergence point (block 203). Hence, a convergence point, or first control independent instruction in Chou’s terms, is not equivalent to an exact convergence point. Examiner thus incorrectly suggests that Chou teaches a first circuit to detect an exact convergence point.

Examiner has not relied upon and Applicants have been unable to discern any part of Keller or Roberts that teaches these elements of claims 1 and 16. Thus, Chou in view of Keller and further in view of Roberts does not teach or suggest each of the elements of claims 1 and 16,

as amended. Accordingly, reconsideration and withdrawal of the obviousness rejection of claims 1 and 16 are requested.

In regard to claims 2-5, 8, 9, 17-20, 23 and 24, these claims depend from independent claims 1 and 16, respectively, and incorporate the limitations thereof. Thus, at least for the reasons mentioned above in regard to independent claims 1 and 16 these claims are not obvious over Chou in view of Keller and further in view of Roberts. Accordingly, reconsideration and withdrawal of the obviousness rejection of these claims are requested.

In regard to claims 10 and 25, as amended, these claims include the elements of “re-executing a second selected subset of said set of instructions subsequent to an exact convergence point” (emphasis added). Applicants believe that Chou in view of Keller and further in view of Roberts does not teach or suggest these elements of claims 10 and 25. Examiner cites Chou (pg. 111, section 2.1.2.1) as teaching these elements and indicates that the “second selected subset” is taught by Chou as “instructions that are control independent and data dependent” (Office Action, pg. 8). However, Examiner fails to specifically indicate where Chou discloses re-executing a second selected subset of said set of instructions subsequent to an exact convergence point. As explained above in regard to claims 1 and 16, a first control independent instruction is not equivalent to an exact convergence point. It follows that instructions subsequent to a first control independent instruction (i.e., “instructions that are control independent”) are not equivalent to instructions subsequent to an exact convergence point. Further, control independent instructions may be data dependent without being subsequent to an exact convergence point. Examiner thus incorrectly suggests that Chou teaches re-executing a second selected subset of said set of instructions subsequent to an exact convergence point.

Examiner has not relied upon and Applicants have been unable to discern any part of Keller or Roberts that teaches these elements of claims 10 and 25. Thus, Chou in view of Keller

and further in view of Roberts does not teach or suggest each of the elements of claims 10 and 25, as amended. Accordingly, reconsideration and withdrawal of the obviousness rejection of claims 10 and 25 are requested.

In regard to claims 11-14 and 26-29, these claims depend from independent claims 10 and 25, respectively, and incorporate the limitations thereof. Thus, at least the reasons mentioned above in regard to independent claims 10 and 25 these claims are not obvious over Chou in view of Keller and further in view of Roberts. Accordingly, reconsideration and withdrawal of the obviousness rejection of these claims are requested.

Claims 6 and 21 stand rejected under 35 U.S.C. § 103 as being unpatentable over Chou in view of Keller in view of Roberts and further in view of "Computer Architecture: A Quantitative Approach" by Hennessey et al., (hereinafter "Hennessey").

Claims 6 and 21 depend from independent claims 1 and 16, respectively, and these claims incorporate the limitations of their respective independent claims. Thus, at least for the reasons mentioned above in regard to independent claims 1 and 16, Chou in view of Keller and further in view of Roberts does not teach each of the elements of these claims. Further, Hennessey does not cure the defects of Chou, Keller, and Roberts. Examiner has not relied upon and Applicants have been unable to discern any part of Hennessey that teaches or suggests a first circuit to detect an exact convergence point. Thus, Chou, Keller, Roberts and Hennessey do not teach or suggest each of the elements of claims 6 and 21. Accordingly, reconsideration and withdrawal of the obviousness rejection of these claims are requested.

Claims 7 and 22 stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Chou in view of Keller in view of Roberts in view of Hennessey and in further view of "Branch Prediction Using Selective Branch Inversion" by Manne et al. (hereinafter "Manne").

Claims 7 and 22 depend from independent claims 1 and 16 and incorporate the limitations thereof. Thus, at least for the reasons mentioned above in regard to independent claims 1 and 16, Chou, Keller, and Roberts do not teach or suggest each of the elements of these claims. Further, neither Hennessey nor Manne cures the defects of Chou, Keller, and Roberts. Examiner has not relied upon and Applicants have been unable to discern any part of Hennessey or Manne that teaches or suggests a first circuit to detect an exact convergence point. Thus, Chou, Keller, Roberts, Hennessey and Manne fail to teach or suggest each of the elements of claims 7 and 22. Accordingly, reconsideration and withdrawal of the obviousness rejection of claims 7 and 22 are requested.

Claims 15 and 30 stand rejected under 35 U.S.C. § 103 as being unpatentable over Chou in view of Keller in view of Roberts and in further view of Manne.

Claims 15 and 30 depend from independent claims 10 and 25, respectively, and incorporate the limitations thereof. Thus, at least for the reasons mentioned above in regard to independent claims 10 and 25, Chou, Keller, and Roberts fail to teach each of the elements of these claims. Further, Manne does not cure the defects of Chou, Keller, and Roberts. Examiner has not relied upon and Applicants have been unable to discern any part of Manne that teaches or suggests a first circuit to detect an exact convergence point. Thus, Chou, Keller, Roberts and Manne do not teach or suggest each of the elements of claims 15 and 30. Accordingly, reconsideration and withdrawal of the obviousness rejection of claims 15 and 30 are requested.

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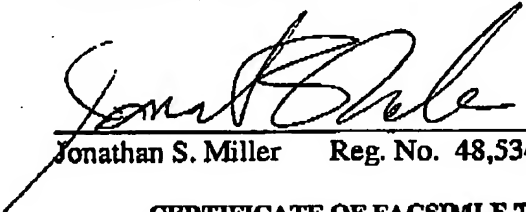
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CONCLUSION

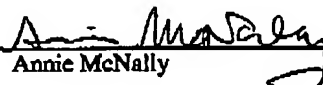
In view of the foregoing, it is believed that all claims now pending, namely claims 1-30, patentably define the subject invention over the prior art of record, and are in condition for allowance and such action is earnestly solicited at the earliest possible date. If Examiner believes that a telephone conference would be useful in moving the application forward to allowance, Examiner is encouraged to contact the undersigned at (310) 207 3800.

Respectfully submitted,

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Dated: October 23, 2006
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I hereby certify that this correspondence is being transmitted via facsimile to 571-273-8300 addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.


Annie McNally10/23/2006
Date